

NOTE

The Presence of Antero-lateral Abdominal Glands in *Euderomphale* (Hymenoptera: Chalcidoidea: Eulophidae)

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Quicke *et al.* (1997) discussed the presence of antero-lateral abdominal glands (ALAGs) in the braconid subfamily Braconinae, and provided detailed anatomical descriptions of them. Virtually all braconines possess these glands, although they are not known in other braconid subfamilies. They are eversible, sac-like glandular invaginations of the unsclerotized lateral cuticle between the terga and sterna on the first and second metasomal (second and third abdominal) segments. ALAGs are present in both sexes, and produce an odoriferous secretion which is characteristic of braconine wasps.

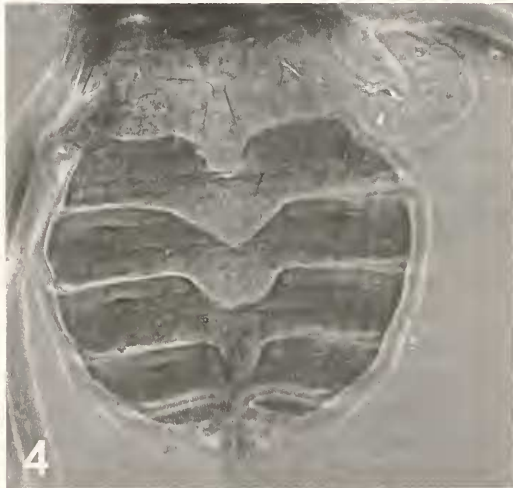
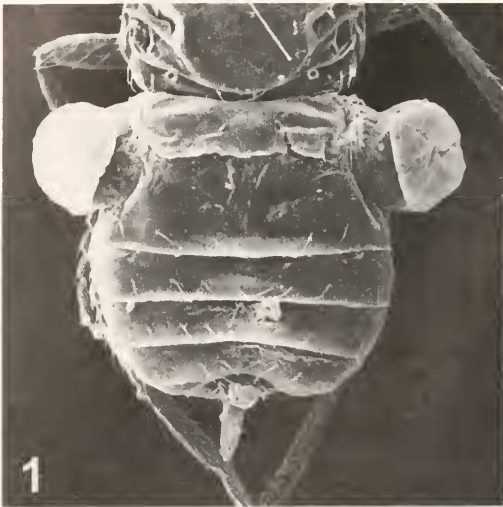
The exact function of ALAGs in braconines is unknown. Since the glands are everted, and their product secreted, most notably when the wasps are disturbed, Quicke *et al.* (1977) suggested that the product might be a chemical that was distasteful to predators. However, they also discussed several problems with this possibility, including that braconines were not distasteful to vertebrates, and that arthropods avoided non-braconines (without ALAGs) as readily as they avoided braconines (with ALAGs). Similarly, the role of ALAGs in the production of sex pheromones was questioned as these glands are present in both sexes. Another suggestion was that the ALAGs play a more general role in intra-specific signaling, such as an aggregation or alarm pheromone. Quicke *et al.* (1997) recorded ALAGs only in Braconinae and *Diprion*

similis (Diprionidae), although they concluded that it was unlikely that these are homologous structures.

The present paper reports the presence of ALAGs in the eulophid genus *Euderomphale*, species of which are parasitoids of whiteflies (see LaSalle and Schauff 1994 for a discussion of the systematic placement of this genus). This is the first report of the presence of these glands in any member of the Chalcidoidea.

The ALAGs in *Euderomphale* seem similar to those of braconines in that they appear to be eversible, sac-like invaginations of the unsclerotized cuticle between the terga and sterna of the second metasomal (third abdominal, first gastral) segment. There is only a single pair of the glands, and these are present in both sexes (Figs. 1–6). As with braconines, their function is unknown, but it is not clear that they are used in response to disturbance, as one of us (AP) has actually observed *Euderomphale* held in plastic bags everting and retracting these ALAGs while there was nothing obvious to disturb them. It may be that in *Euderomphale*, as suggested by Quicke *et al.* (1997), the ALAGs play a more general role in intra-specific signaling, but what this role might be remains unknown.

It is also worth noting that the shape of the anterior margin of the gastral tergites appears to provide useful characters for differentiation of species in *Euderomphale*. For example, in *E. cortinae* Graham (Figs.



3-4) the second gastral tergite is deeply emarginate medially, and there are similar emarginations on tergites 3 and 4, although these are more prominent in males (Fig. 4) than females (Fig. 3). In *E. flavimedia* (Howard) (Figs. 5-6), the first gastral tergite is slightly produced medially with a very small incision, with very broad, shallow lateral emarginations; tergites 3 and 4 are entire or only very slightly emarginate. This condition is found in

both males and females. Slide-mounted material is necessary to clearly see this character.

LITERATURE CITED

LaSalle, J. and M.E. Schauff. 1994. Systematics of the tribe Euderomphalini (Hymenoptera: Eulophidae): parasitoids of whiteflies (Homoptera: Aleyrodidae). *Systematic Entomology* 19: 235-258.

Quicke, D.L.J., R.A. Wharton and H. Sittertz-Bhatkar. 1997. Antero-lateral abdominal scent glands of braconine wasps (Hymenoptera: Braconidae). *Journal of Hymenoptera Research* 6: 219-230.

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Figs. 1-6. *Euderomphale* species. 1-4. *Euderomphale cortinae* Graham. 1, male gaster, showing ALAGs. 2, close up of ALAG. 3, female gaster. 4, male gaster. 5-6. *Euderomphale flavimedia* (Howard). 5, female gaster. 6, male gaster.